
Space Weather Forecast

Issued on Saturday, 01 July 2023 at 01:28 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales <https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales>

Space Weather Forecast Headline: Daily Chance of Minor/Moderate R1/R2 Radio Blackouts. Chance of Minor G1 Geomagnetic Storm intervals today.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity has been Low over the past 24 hours, with X-ray activity showing occasional Common-class flares, the largest of which originated from the largest and most magnetically complex sunspot group on the visible side of the Sun, in the northwest quadrant. This group has shown some spreading in the period, with a tendency for a slight overall decrease in area, although it remains potentially potent. This was one of up to six sunspot regions on the Earth-facing side of the Sun. The remaining sunspots, four numbered and two yet to be numbered, are considerably smaller, weaker and magnetically simple. No Earth directed CME's have been visible in available imagery.

Solar Wind / Geomagnetic Activity: The solar wind indicates a weak connection to a small coronal hole feature in the southwest quadrant.

The solar wind speed was initially at Slightly Elevated levels around 450 km/s but quickly started increasing to Elevated levels, peaking at 592 km/s at 30/1406 UTC, then declining to end the day around 500 km/s. The associated magnetic field was weak throughout, while the important north-south component was weak, and mainly southward until early afternoon and northward thereafter.

The net effect of the above solar wind measures was for Quiet to Unsettled geomagnetic activity.
Energetic Particles / Solar Radiation: No solar radiation storms were observed.

Four-Day Space Weather Forecast Summary

Solar Activity: There is a daily Chance of reaching Moderate levels of activity and with a Slight Chance of reaching High levels of activity. This risk is almost entirely from AR3354 at first, but may be enhanced by returning regions through the forecast period.

Solar Wind / Geomagnetic Activity: A CME which left the northeast quadrant of the Sun on 27 June may glance the Earth early on 01 July, but this is low confidence. A CME associated with the Moderate class flare on the 29th may affect Earth as a glancing blow on Tuesday 04 July. If either or both of the CME's arrive at Earth then Unsettled to Active is likely, with a slight chance of isolated Minor Storms activity occurring.

In the absence of CME activity, the current fast wind from CH18/+ is likely to be the only one in the forecast. However, despite the initially enhanced solar wind speed predominantly Quiet geomagnetic activity is expected, before the solar wind gradually declines later in the forecast period.

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Energetic Particles / Solar Radiation: Solar radiation storms are not expected in the period and levels of protons are most likely to remain at Background levels. There remains a daily slight chance of reaching the S1/Minor Storm level, mainly due to the large sunspot region.

Geomagnetic Storms:

Geo-Magnetic Storm	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC)	Day 2 (00-24 UTC)	Day 3 (00-24 UTC)	Day 4 (00-24 UTC)
Probability (Exceedance)			(%)	(%)	(%)	(%)
Minor or Moderate	G1 to G2	No	30	5	1	20
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC)	Day 2 (00-24 UTC)	Day 3 (00-24 UTC)	Day 4 (00-24 UTC)
Probability			(%)	(%)	(%)	(%)
Active	R1-R2 M Class	No	40	40	40	40
Very Active	R3 to R5 X	No	5	5	5	5

Solar Radiation Storms - (High Energy Protons):

Radiation Storms	Level (cm ⁻² sr ⁻¹ s ⁻¹)	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC)	Day 2 (00-24 UTC)	Day 3 (00-24 UTC)	Day 4 (00-24 UTC)
Probability (Exceedance)			(%)	(%)	(%)	(%)
Active	≥ S1	No	10	10	10	10
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = cm⁻²sr⁻¹s⁻¹)